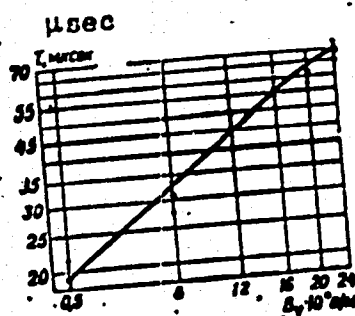


ACCESSION NR: AT4036059

ENCLOSURE: 02



Dependence of plasma lifetime on the magnetic field intensity in the gap.

Card 5/5

VOLKOV, Ya.F.; TOLOK, V.T.; KRIVORUCHKO, S.M.

O-pinch plasma in a magnetic net. Zhur. tekhn. fiz. 33
no.9:1093-1097 S '63. (MIRA 16:11)

L 06309-6/ EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) AT/JD/GD
 ACC NR: AT6020456 (N) SOURCE CODE: UR/0000/65/000/000/0241/0248

AUTHOR: Volkov, Ya. F.; Dyatlov, V. G.; Mitina, N. I.

ORG: none

TITLE: Investigation of a θ -pinch plasma with an azimuthal magnetic field

SOURCE: AN UkrSSR. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy (Interaction of charged particle beams with plasma). Kiev, Naukova dumka, 1965, 241-248

TOPIC TAGS: plasma pinch, plasma heating, theta particle, plasma magnetic field, Coulomb collision, ion temperature, helium plasma, gamma radiation

ABSTRACT: Theta-pinch discharge was investigated experimentally to obtain information on the ion and electron energies associated with accelerated beams in plasma emitting strong γ -radiation (500 kev range, 10^{13} quanta/discharge). A helium plasma in a spherical vessel was used for this study. The plasma was subjected to an azimuthal magnetic field obtained in the hard-core configuration and ($3 \cdot 10^{-5}$ sec later) in an axial field from the superimposed four-turn coils. The diagnostics consisted mainly of measuring Doppler broadening of the spectral lines for ion energy determination and measurement of the relative intensities of two He lines gave the electron temperature. These measurements were made for several regions in the plasma. Very rapid growth of the ion temperature was found to eliminate Coulomb collisions as a heating mechanism.

Card 1/2

L 08309-57

ACC NR: AT6020456

It was therefore assumed that beam instability was responsible for rapid heating. This assumption was substantiated by observing rather strong emissions of microwave radiation in the experiments with azimuthal and axial fields. The microwave noise tended to cluster in the frequency range of the electron, plasma and cyclotron frequencies. In addition, the azimuthal field was found to stabilize the plasma due to changed compression conditions. Orig. art. has: 6 figures.

SUB CODE: 20/

SUBM DATE: 11Nov65/

ORIG REF: 003/

OTH REF: 003

Card 2/2 *gd*

L 8217-66 EWT(1)/EWG(m) IJP(c) AT
 ACC NR: AT5022302
 AUTHOR: Volkov, Ya. F.; Dyatlov, V. G.; Mitina, N. I.
 ORG: Academy of Sciences UkrSSR, Physicotechnical Institute (Akademiya nauk UkrSSR, Fiziko-tehnicheskii institut)

TITLE: Investigation of a θ -pinch plasma with an azimuthal magnetic field

SOURCE: AN UkrSSR. Fiziko-tehnicheskii institut. Doklady, no. 069/P-023, 1964.
 Issledovaniye plazmy θ -pincha s azimuthal'nym magnitnym polem, 1-10

TOPIC TAGS: plasma containment, helium plasma, plasma heating

ABSTRACT: A θ -pinch device was used to study the ion and electron energy distributions and the processes leading to the energy exchange between electrons and ions during the compression phase. A large spherical (110 mm diameter) vessel containing helium was placed within magnetic mirror coils. The magnetic field with a period of $30 \cdot 10^{-6}$ sec reached a peak value of 16 koe. Additionally, an azimuthal magnetic field was added $30 \cdot 10^{-6}$ sec earlier by means of an axial conducting rod carrying a current of up to 100 ka. The average and time-resolved ion temperature was obtained by determining the Doppler broadening of N and H_α spectral lines from several discharges. An additional photomultiplier system was used for electron and ion temperature determination during one discharge. The upper limit on the electron temperature was es-

Card 1/2

L 8217-66

ACC NR: AT5022302

established by the observation of the soft X-rays which were analyzed by a set of thin metal foils. Radio noise (3 cm wavelength) of one watt intensity was observed in a waveguide receiver. The temperature measurements were carried out in the pressure range of 1 to $2 \cdot 10^{-3}$ mm Hg. An ion temperature of 100 ev and electron temperature of 4 kev were reached. The heating mechanism is ascribed to the microwave noise and small value of the Coulomb collision crosssections. It was also noted that the azimuthal field has a gross stabilizing effect and also extends the plasma containment time. Orig. art. has: 6 figures.

SUB CODE: 20/

SUBM DATE: 00/

ORIG REF: 003/

OTH REF: 003

2/2

VOIKOV, Ya.F.; DYATLOV, V.G.; MITINA, N.I.

Investigating a O-pinch plasma with an azimuthal magnetic field.
Zhur. tekhn. fiz. 35 no.6:1039-1043 Je '65. (MIRA 18:7)

L 54763-65 ENT(1)/EPF(n)-2/ENG(m)/EPA(w)-2 Pz-6/Po-4/Pab-10/P1-4 IJP(c) KW/AT
 UR/0057/65035/006/1039/1043

ACCESSION NR: AP5015626

AUTHOR: Volkov, Ya.F.; Dyatlov, V.G.; Mitina, N.I.

TITLE: Investigation of a theta pinch plasma in an azimuthal magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.6, 1965, 1039-1043

TOPIC TAGS: plasma heating, plasma instability, plasma oscillation, plasma pinch, azimuthal magnetic field, ion temperature, electron temperature

ABSTRACT: The authors have measured ion and electron temperatures in a helium plasma in an external azimuthal magnetic field. The measurements were undertaken because of the earlier discovery of hard gamma-radiation from such plasmas (Ya.F.Volkov, V.T.Tolok and K.D.Sinelnikov, ZhTF 32,811,1962). The plasmas were produced in an 11 cm diameter spherical glass vessel containing helium at approximately 10^{-5} mm Hg by the 20 kV discharge of an 18 micro fd capacitor through two windings of four turns each. The period of the resulting magnetic

Card 1/3

L 54763-65

ACCESSION NR: AP5015626

field was 30 microsec and the amplitude reached 16 kOe. The azimuthal magnetic field was provided by the 3 kV discharge of a 2400 microfd capacitor through a copper rod traversing the vessel. The period of this system was 425 microsec and the current reached 100 kA. The ion temperatures were determined from the Doppler broadening of several lines in the optical spectrum and the electron temperatures were determined from the relative intensities of two or more lines. The time variation of the temperatures was followed by measuring at different phases of different discharges. The average ion temperatures were of the order of 40 to 60 eV. Electron temperatures exceeding 1 keV were observed. Soft x-ray absorption measurements indicated that electron temperatures greater than 4 keV did not occur. Radio noise of the order of 1 W was observed at 3 cm wavelength. The time dependence of the ion and electron temperatures was characterized by a rapid rise to a maximum within a few microseconds and a subsequent decrease. The electron temperature showed a small secondary maximum at about 6 microsec. The rapid rise of the ion temperature cannot be accounted for by collisions with electrons; it is as-

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L 54763-65

ACCESSION NR: AP6015626

cribed to plasma instability involving pulsations at approximately the Langmuir frequency. "The authors express their gratitude to V. T. Tolok for suggesting the topic, offering valuable advice and discussing the results." Orig. art. has: 6 figures.

ASSOCIATION: none

SUBMITTED: 04Jul64

ENCL: 00

SUB CODE: ME, E14

NR REF SOV: 003

OTHER: 003

VOLKOV, Ya. N.

ZHMAKIN, K.N.; VOLKOV, Ya.N.; RAPINA, M.M.

Caesarean section in contemporary *gynecology*. Akush. gin. no. 3:30-40 May-June 1952. (CLML 22:5)

1. Professor for Zhmakin; Candidate Medical Sciences for Volkov.
2. Moscow.

VOL KOV, Ya. N.

SYROVATKO, F.A., professor; VOLKOV, Ya.N., zasluzhenny vrach RSFSR;
LYUBIMOV, N.I., dotsent.

Etiology, clinical aspects, and therapy of atonic (hypotonic)
hemorrhages in placental and early puerperal stages. Akush.i gin.
no.2:64-68 Mr-Ap '55. (MLRA 8:7)

(LABOR,
third stage, with hypotonic hemorrh.)
(PUERPERIUM, complications,
hemorrh., hypotonic)
(UTERUS, hemorrhage,
in third stage & puerperium)
(HEMORRHAGE,
uterus, in third stage & puerperium)

VOIKOV, YA. R.

RAYKO, V.V. nauchnyy sotrudnik; VOLKOV, Ya. R. nauchnyy sotrudnik; LEVITSKIY, D.A. nauchnyy sotrudnik; KHODAK, A.N. nauchnyy sotrudnik; RATNER, Yu. Z. inzhener; VORODIMOV, N.I. inzhener; GRISHAYEV, N.N. inzhener; SHULYATSKIY, D.I. inzhener, redaktor; ANDREYEV, S.A. tekhnicheskiy redaktor

[Rules for the technical operation of cranes] Pravila tekhnicheskoi ekspluatatsii pod" emnykh kranov. Khar'kov, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 167 p.
(MLRA 10:5)

1. Russia (1923 U.S.S.R.) Ministerstvo chernoy metallurgii.
2. Vsesoiyznyy nauchno-issledovatel'skiy institut organizatsii chernoy metallurgii. (for Rayko, Volkov, Levitskiy, Khodak)
3. Otdel glavnogo mekhanika Ministerstva chernoy metallurgii. (for Shulyatskiy) 4. Zavod "Azovstal'" (for Ratner) 5. Zavod "Zaporozhstal'" (for Vorodimov, Grishayev)
(Cranes, derricks, etc.)

RAYKO, V.V., nauchnyy sotrudnik.; VOIKOV, Ya.R., nauchnyy sotrudnik.;
NEVEDUYUSHCHIY, A.I., nauchnyy sotrudnik.; IPATOV, P.P., inzh., red.;
SHULYATSKIY, D.I., inzh., red.; VORODIMOV, M.I., inzh., red.;
ANDREYEV, S.P., tekhn. red.

[Instructions for the operation of the mechanical equipment of
open-hearth shops] Pravila tekhnicheskoi eksploatatsii mekhanicheskogo
oborudovaniia martenovskikh tsekhov. Khar'kov, Gos. nauchno-tekhn.
izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 112 p.
(MIRA 11:11)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skii inetitut organizatsii
proizvodstva i truda chernoy metallurgii (for Rayko, Volkov,
Neveduyushchiy). 2. Ministerstvo chernoy metallurgii (for Ipatov,
Shulyatskiy). 3. Zavod "Zaporozhstal'" (for Vorodimov).
(Open-hearth process)

VDOVIN, R.A.; VOLKOV, Ya.I., inzh. (Leningrad); TITOV, G.Ye.; KANIN, A.B.

Improving the quality of switches. Put' 1 put. khoz. no.8:18-19
Ag '59. (MIRA 13:3)

1.Starshiy dorozhnyy master Moskovskoy distantzii puti Severnoy dorogi
(for Titov). 2.Starshiy dorozhnyy master, stantsiya Polotsk, Belorusskoy
dorogi (for Kanin).

(Railroads---Switches)

RAYKO, V.V., nauchnyy sotrudnik; NIKBERG, I.M., nauchnyy sotrudnik;
KHODAK, A.N., nauchnyy sotrudnik; NEVEDUSHCHIY, A.I., nauchnyy
sotrudnik; VOLKOV, Ya.R., nauchnyy sotrudnik; PEYCHEV, G.P., otv.
red.; IPATOV, P.P., red.; SHULYATSKIY, D.M., red.; BURKSER, L.D.,
red.; BALASEVICH, Yu.Yu., red.; SVETCHENKO, V.N., red.; KRYLOVSKIY,
A.P., red.; SINYAVSKAYA, Ye.K., red.izd-va; ANDREYEV, S.P., tekhn.red.

[Regulations for operating the mechanical equipment of rolling mills]
Pravila tekhnicheskoi ekspluatatsii mekhanicheskogo oborudovaniya
prokatnykh tsekhov. Khar'kov, Gos.nauchno-tekhn.izd-vo lit-ry po
chernoi i tsvetnoi metallurgii, 1959. 247 p. (MIRA 12:9)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy insitut organi-
zatsii proizvodstva i truda chernoy metallurgii. 2. Vsesoyuznyy
nauchno-issledovatel'skiy institut organizatsii proizvodstva i truda
chernoy metallurgii (VNII OCHERMET) (for Rayko, Nikberg, Khodak, Neve-
dushchiy, Volkov). 3. Otdel glavnogo mekhanika byvshego Ministerstva
chernoy metallurgii SSSR (for Ipatov, Shulyatskiy). 4. Zavod imeni
Dzerzhinskogo (for Burksar, Balasevich). 5. Zavod imeni Kirova (for
Svetchenko). 6. Zavod imeni Voroshilova (for Krylovskiy).
(Rolling mills--Equipment and supplies)

VOLKOV, Ya.R., inzh.

Aerodynamics of the formation deviated gas flow in the
charging apparatus of blast furnaces. Stal' 21 no.12:
1075-1077 D '64. (MIRA 18:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut organizatsii
proizvodstva i truda chernoy metallurgii.

VOLKOV, Ya.R.

Ways of increasing the durability of blast furnace charging
equipment. Metallurg 10 no.1:12-13 Ja '65. (MIRA 18:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut organi-
zatsii proizvodstva i truda chernoy metallurgii.

VOLKOV, Ya.R., inzh.; KORDABNEV, I.L., inzh.

Rate of gas effusion through the interstices of blast furnace
charging equipment. Stal' 24 no.5:400-402 My '64.

(MIRA 17:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut organizatsii
proizvodstva i truda chernoy metallurgii i Dneprovskiy
metallurgicheskiy zavod im. Dzerzhinskogo.

VOLKOV, Ya.V.

Construction industry of Leningrad. Stroil. mat. 10 no.5:
32-34 My '64. (MIRA 17:9)

VOIKOV, Ia.7.

Example of a plant near Moscow. Strof. mat. 11 no.4:22-24
Ap '65. (MIRA 18:6)

VOLKOV, Ya.Ya.

Produce two to three times as much forage. Nauka i pered. op. v
sel'khoz. 7 no.10:21-23 0 '57. (MIRA 10:11)

1. Predsedatel' kolkhoza imeni Karla Marksa, Bauskogo rayona,
Latviyskoy SSR.

(Feeding and feeding stuffs)

KITAYNIK, A.U.; LARIONOV, N.N., zhurnalist; BRATCHIKOV, B., zhurnalist;
 BYKOV, V., zhurnalist; VOLKOV, Ye., zhurnalist; VOSKRESENSKIY, N.,
 zhurnalist; GERVASH, A., zhurnalist; GORDIN, A., zhurnalist;
 GILENKO, A., zhurnalist; DASEKOV, S., zhurnalist; DROBOTUSHENKO, A.,
 zhurnalist; YERSHOV, N., zhurnalist; ZHUIYABIN, A., zhurnalist;
 KRASNOV, I., zhurnalist; LUCEINETSKIY, Ye., zhurnalist; LYKOV, M.,
 zhurnalist; MEYSAK, N., zhurnalist; PADERIN, G., zhurnalist; PAL'M, A.,
 zhurnalist; PONOMAREV, P., zhurnalist; RUBINA, M., zhurnalist; TAGIROV, T.,
 zhurnalist; TIMOFEYEV, B., zhurnalist; YANSHIN, V., zhurnalist;
 TRUBITSIN, N.A., ctv.red.; OMBYSH-KUZNETSOV, S., red.izd-va; TOBUKH, A.,
 tekhn.red.

[Novosibirsk; a collection] Novosibirsk; sbornik. Novosibirskoe knizh-
 noe izd-vo, 1961. 180 p. (MIRA 15:5)
 (Novosibirsk--History) (Novosibirsk--Description)

VOLKOV, Ye. [Volkov, IE.]

Inspired by the grand program. Sil'. bud. 11 no.10:3-5 0 '61.
(MIRA 14:11)

1. Predsedatel' soveta Kamyanets-Podol'skoy stroitel'skoy
organizatsii Khmel'nitskoy oblasti.
(Khmel'nitskiy Province (Ukraine)...Construction industry)

VOLKOV, Ya. [Volkov, IA]

Let's recognize timber. Sil'ber. 2 no.3:13 1r '59. (MIRA 12:7)

1. Glavnyy iash. Kanchots-Podol'skoy (oshkol'skoy) stroitel'noy
organizatsii Khmel'nitskoy otbatal.
(Dairy burns) (Slag)

VOEKOV, Yr.
VOLKOV, Ye., inzh.

Utilization of natural arches in mining. Mast. ugl. 6 no. 10:15
0 '57. (MIRA 10:12)

(Coal mines and mining)

VOLKOV, Ye., inzh.

Mobile siding. Mast. ugl. 8 no. 2120 P '59.
(MIRA 13:4)

(Mine railroads)

VOLKOV, Ye., inzh.

Complicated problem of miners' wages. Mast. ugl. 7 no.3:18 Mr '58.
(MIRA 11:3)

1.Shakhta "Vostochnaya" tresta Zabaykalugol'.
(Coal miners) (Wages)

VOLKOV, YE.

VOLKOV, Ye., podpolkovnik; IVANOV, P., podpolkovnik.

Blindages and shelters with standard frames. Voen-inzh.shur. 101
no.9:18-23 S '57. (MLRA 10:9)

(Fortification, Field)

S/208/63/003/001/005/013
B112/B102

AUTHOR: Volkov, Ye. A. (Moscow)

TITLE: Removal of singularities on solving boundary-value problems
for the Laplace equation in a region with a smooth boundary

PERIODICAL: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki,
v. 3, no. 1, 1963, 109-119

TEXT: The method applied has been developed by L. V. Kantorovich (Tr.
Leningr. in-ta inzh. prom. stroit., 1934, 1, no. 2, 65-78). It consists
of the following: A harmonic function, with analogous singularities at
the boundary as the sought function, is constructed explicitly. The
remaining part of the solution has to be regular. It may be calculated
by any approximation process. This method is applied to the Dirichlet
problem, to the Neumann problem, and to the third boundary-value problem.
There are 4 tables.

SUBMITTED: March 30, 1962

Card 1/1

NASRULLAYEV, Kh.; VOLKOV, Ye.

Fire at a cotton-storage station. Posh.delo 5 no.7:21 Jy '59.
(MIRA 12:9)

(Bukhara--Cotton--Storage) (Bukhara--Fire extinction)

VOLKOV, Ye. A.

Mathematical Reviews
Vol. 14 No. 7
July - August, 1953
Numerical and Graphical Methods.

✓ Volkov, E. A. A mechanical apparatus for the solution of Poisson's equation and certain other equations of elliptic type. Vestnik Moskov. Univ. Ser. Fiz.-Mat. Estest. Nauk 1950, no. 10, 3-17 (1950). (Russian)

VOLKOV, Ye. A. --

"An Investigation of Certain Questions in the Solution, by the Method of Finite Differences, of the Dirichlet Problem for the Laplace and Poisson Equations." Cand Phys-Math Sci, Mathematics Institute V. A. Steklov, Acad Sci USSR, 4 Nov 54. (VI, 22 Oct 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (10)

SO: Sum. No. 421, 5 May 55

VOLKOV, E. A.
USSR/Mathematics

Card : 1/1

Authors : Volkov, E. A.

Title : Estimations of an error in solving, by the method of matrices, of the Dirichlet problem applied to the Laplace equation.

Periodical : Dokl. AN SSSR, 96, Ed. 5, 897 - 899, June 1954

Abstract : Errors which may occur in solutions by the matrix method of the Dirichlet problem applied to the Laplace equation are analyzed together with the following methods: 1) Garshgorin's differential operator, Δ_h , and 2) The method based on application of Green's differential functions. Eleven references.

Institution :

Presented by : Academician, S. L. Sobolev, March 25, 1954

VOLKOV, E. A.

USSR/Mathematics

Card : 1/1

Authors : Volkov, E. A.

Title : About a method of increasing the accuracy of the lattice method

Periodical : Dokl. AN SSSR, 96, Ed. 4, 685 - 688, June 1954

Abstract : The results obtained in studying a special method of refining the solution of the Dirichlet problem for a Poisson equation in the zone G with a curvilinear boundary R for two-dimensional case is described. The results can be directly applied to three-dimensional cases. Five references.

Institution : ...

Presented by : Academician S. L. Sobolev, March 25, 1954

VOLKOV Ye. A.

USSR/ Mathematics -- The network method

Card 1/1 Pub. 22 - 4/62

Authors : Volkov, Ye. A.

Title : Regarding the solution of equations of the elliptical type with boundary conditions containing derivatives.

Periodical : Dok. AN SSSR 102/3, 437 - 440, May 21, 1955

Abstract : The method of finite difference approximations (network method) with normal and slant derivatives is analyzed in connection with its application to the solution of boundary problems of curved regions or polynomials represented by elliptical equations. A proof is given that the problems solved by this method would not have errors bigger than h^2 ; where the h is the step between the network lines. Five references: 3 USSR, 1 Brit., and 1 Germ. (1949-1954). Graphs.

Institution : The Acad. of Scs., USSR, Institute of Precision Mechanics and Calculating Techniques

Presented by: Academician S. L. Sobolev, February 3, 1955

VOLKOV, Ye. A.

**Numerical solution for the Lavrent'ev-Bitsadze problem. Dokl. AN
SSSR 103 no.5:755-758 Ag '55. (MLBA 9:1)**

**1. Institut tekhnicheskoy mekhaniki i vychislitel'noy tekhniki Akademii
nauk SSSR. Predstavleno akademikom M.A. Lavrent'yevym.
(Difference equations)**

VOLKOV, YE. A., Cand. in Phys. Math. Sci.

"Increasing the Speed of Calculation of Elementary Functions in the BESM" a paper presented at the Conference on Methods of Development of Soviet Mathematical Machine-Building and Instrument-Building, 12-17 March 1956.

Translation No. 596, 8 Oct 56

VOLKOV, E. A.

Volkov, E. A. On numerical solution of the problem of
Laurent's Bicadze. Dokl. Akad. Nauk SSSR (N.S.)
103 (1955), 755-758. (Russian)

1 - F/W

The author exhibits a difference method for the upper
half-plane in approximating the solution of the La-
urent's Bicadze equation, differing somewhat from that
of Ladyženskaya (Uspehi Mat. Nauk (N.S.) 9 (1954), no.
4(62), 187-189; MR 16, 11:0]. W. E. Milne.

Handwritten signature

L 07970-67 EWT(d) IJP(c)

ACC NR: AP6021601

SOURCE CODE: UR/0020/66/168/005/0978/0981

AUTHOR: Volkov, Ye. A.

ORG: Mathematics Institute im. V. A. Steklov, Academy of Sciences, SSSR
(Matematicheskii institut Akademii nauk SSSR)

TITLE: Grid method for finite and infinite regions with piecewise smooth boundary

SOURCE: AN SSSR. Doklady, v. 168, no. 5, 1966, 978-981

TOPIC TAGS: finite difference, Dirichlet problem, approximation calculation, Laplace equation

ABSTRACT: The author is concerned with a finite difference method for solution of the Dirichlet problem for the Laplace equation. The method is associated with a thinning-out polar grid on infinite branches of the region, and a base-square grid with step size h covering the finite parts of the region and intersecting with the polar grids. The difference operators used at interior nodes of the grid yield the desired value as the arithmetic mean of the function at four neighboring nodes. The solution converges uniformly to the bounded solution of the posed problem at the rate of $h^2 \log \frac{1}{h}$. The problem is originally solved for infinite regions with piecewise smooth boundary having a finite number of angles $\alpha_j \pi$, $0 \leq \alpha_j \leq 2$, and having for boundary functions

Card 1/2

UDC: 518.517.944/947

L 07970-67

ACC NR: AP6021601

ones which on boundary pieces between angular points have Hölder continuous third derivative, decreasing rather rapidly at ∞ . The method generalizes to non-simply connected regions and to ones with boundaries, infinite branches of which are asymptotically certain algebraic curves. This paper was presented by Academician A. A. Dorodnitsyn on 12 October 1965. Orig. art. has: 3 formulas.

SUB CODE: 12/ SUBM DATE: 11Oct65/ ORIG REF: 006/ OTH REF: 002

Card 2/2 *HL*

L 07254-67 EWT(d) LJP(c)

ACC NR: AP6018631

SOURCE CODE: UR/0208/66/006/003/0503/0511

AUTHOR: Volkov, Ye. A. (Moscow)

ORG: none

TITLE: A lattice method for the external Dirichlet problem

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 6, no. 3, 1966, 503-511

TOPIC TAGS: difference method, Dirichlet problem, Laplace equation, approximate solution

ABSTRACT: A method for the approximate solution on a polar lattice of the external Dirichlet problem for the two-dimensional Laplace problem has been proposed. Since the external Dirichlet problem can be reduced to the corresponding internal problem, the author often utilizes this property; however, the difference equation of the approximate solution is established directly over the lattice spanned within the given unbounded region. The lattice is chosen in such a way that the sought for unknown is given by the average arithmetic value of the four nearest lattice points. If the solution of the Laplace equation has bounded second derivatives within a closed region, the error of the approximate solution is of the order of $h^2(1 + |\ln h|)$, where h is the step of the lattice. The method for the establishment of an auxiliary system of difference equations with free terms (expressible through known quantities)

Card 1/2

UDC: 518:517.944/.947

L 07254-67

ACC NR: AP6018631

which gives the upper limit of the approximate solution is also presented. Orig. art. has: 44 formulas.

SUB CODE: 12/ SUBM DATE: 06Jul65/ ORIG REF: 009/ OTH REF: 002

Card 2/2

ACC NR: AT6034336

SOURCE CODE: UR/0000/66/000/000/005/0017

AUTHOR: Volkov, Ye. A. (Moscow)

ORG: none

TITLE: Obtaining an estimate for the error of numerical solution of the Dirichlet problem in terms of known values

SOURCE: Chislennyye metody resheniya zadach matematicheskoy fiziki (Numerical methods of solving problems in mathematical physics); sbornik statey. Moscow, Izd-vo Nauka, 1966, 5-17

TOPIC TAGS: Dirichlet problem, error, bounded function, boundary value problem, approximate solution, numeric solution, Laplace equation, continuous function, difference equation

ABSTRACT: A method of obtaining real error estimates is proposed. The method is based on the following theses: 1) in order to obtain estimates of the error of numerical solution of a Dirichlet problem of order $h^2(1 + |\ln h|)$, it is sufficient to estimate U^2 , without resorting to estimates of U^3 and U^4 ; 2) only the discrepancies in the desired solution in each difference equation should be estimated analytically, separately, and accurately as possible; 3) analytic integral error estimates should not be sought; 4) the majorant of the error can be obtained in a network in the form

UDC: 518:517.944/.947

Card 1/2

ACC NR: AT6034336

of the solution of an auxiliary system of difference equations with free terms, which are estimates of the absolute values of the discrepancies of the desired solution. The bounds of the first derivatives are found for the boundary value problem

$$\Delta u = 0 \text{ in } G, u = \varphi(s) \text{ at } \gamma.$$

where $\varphi(s)$ is twice differentiable and has a piecewise-continuous bounded third derivative. The bound of the second derivatives is found for

$$\left. \frac{\partial^2 u}{\partial x \partial y} \right|_{x=0, y=0} = \frac{1}{2\pi\rho^2} \int_{-\pi}^{\pi} \frac{\sin \theta}{(1 - \cos \theta)^2} v(\rho, 0) d\theta = \sum_{p=1}^3 I_p,$$

where

$$I_1 = \frac{1}{2\pi\rho^2} \int_0^{2\pi-\theta^*} \frac{u(\rho, 0) - \varphi(0)}{(1 - \cos \theta)^2} \sin \theta d\theta;$$

$$I_2 = -\frac{\varphi'(1)(0)}{2\pi\rho} \int_0^{2\pi-\theta^*} \frac{\sin^2 \theta}{(1 - \cos \theta)^2} d\theta;$$

$$I_3 = \frac{1}{2\pi\rho^2} \int_{-\pi}^{\theta^*} \left(\tilde{u}(s) + l \left. \frac{\partial v}{\partial y} \right|_{x=\rho \sin \theta, y=\xi} \right) \frac{\sin \theta}{(1 - \cos \theta)^2} d\theta.$$

A method of obtaining error majorants is given. The author thanks V. I. Veselov for making the calculations. Orig. art. has: 103 formulas.

SUB CODE: 12/ SUBM DATE: 16Apr65/ ORIG REF: 018/ OTH REF: 002

Card 2/2

L 09979-67 ENT(d) IJP(c)
 ACC NR: AP6036024 SOURCE CODE: UR/0376/66/002/010/1358/1373
 AUTHOR: Volkov, Ye. A.
 ORG: Mathematical Institute im. V. A. Steklov (Matematicheskoy institut)
 TITLE: The method of irregular nets for finite and infinite domains with conical points
 SOURCE: Differentsial'nyye uravneniya, v. 2, no. 10, 1966, 1358-1373
 TOPIC TAGS: Dirichlet problem, Laplace equation, finite difference method, irregular net method, approximate solution
 ABSTRACT: The method of irregular nets for solving the Dirichlet problem for Laplace equation in a certain class of finite and infinite three-dimensional domains whose boundary is a three times differentiable function with the exception of a finite number of conical points is proposed. A rectangular irregular net having mesh refinement in the neighborhood of the conical points and large mesh sizes at infinity is constructed. The number of lattice (mesh) points of the net is of the order $h^{-3} \ln^3 h^{-1}$, where h is the mesh size of the net at a distance from the conical point or the origin of coordinates equal to unity. A finite system of difference equations approximating the Dirichlet problem is derived, first for domains with one conical point ($m \leq 1$), and later for domains with several conical points ($m > 1$). Under the assumption that the given function defined on the boundary of the domain has second
 Card 1/2 UDC: 517.946.9:518

L 09979-67

ACC NR: AP6036024

derivatives satisfying the Holder condition at all points of the boundary with the exception of conical points, and with the requirements imposed upon the variation of this function and its derivative at infinity and in the neighborhood of conical points, an approximate solution is obtained and an estimate of the error of approximation of the order h^2 is established. The solution of the axially symmetric case (for the domain and the function defined on the boundary of the domain whose axial symmetry properties with respect to the x_1 -axis are satisfied) is also considered. The obtained approximate solution on the finite net makes it possible to determine the solution of the Dirichlet problem with accuracy of the h^2 order by means of interpolation at any arbitrary point of the finite or infinite domain. It is pointed out that the method of irregular nets for solving the Dirichlet problem can be extended to the n -dimensional case ($n > 3$). Orig. art. has: 86 formulas.

SUB CODE: 12/ SUBM DATE: 28Dec65/ ORIG REF: 011/ OTH REF: 002/
ATD PRESS: 5105

VOLKOV, Ye.A.

Solution of the Dirichlet problem using the method of refinements
by differences of higher order. Part 2. Dif. urav. 1 no.8;
1070-1084 Ag '65. (MIRA 18:9)

1. Matematicheskiy institut imeni Steklova.

L 4290-66 EWT(d) IJP(c)
ACCESSION NR: AP5024200

UR/0020/65/164/003/0479/0482

AUTHOR: Volkov, Ye. A. 44/85

TITLE: Solution of the Dirichlet problem by the method of refinements by differences of higher orders 16, 44, 85

SOURCE: AN SSSR. Doklady, v. 164, no. 3, 1965, 479-482

TOPIC TAGS: differential equation, Laplace equation, Poisson equation, difference equation, approximation calculation, boundary value problem

ABSTRACT: The author studies the boundary value problem

$$\Delta u = f \text{ on } R; \quad u = \varphi_j \text{ on } \Gamma_j, \quad j = 1, 2, 3, 4, \quad (1)$$

where R is the rectangle $\{0 < x < a, 0 < y < b\}$; Γ_j are the sides of the rectangle including the ends. He assumes that

$$f \in C_{2m, \lambda}(\bar{R}), \quad \varphi_j \in C_{2m+2, \lambda}(\Gamma_j), \quad j = 1, 2, 3, 4, \quad (2)$$

where $m \geq 1, 0 < \lambda < 1$, and also

$$f_{x^p y^q}^{(2p+2q)}(x_j, y_j) = 0, \quad 0 \leq p+q \leq m, \quad j = 1, 2, 3, 4, \quad (3)$$

$$\varphi_j^{(2k)}(s_{j1}) = \varphi_j^{(2k)}(s_{j2}) = 0, \quad 0 \leq k \leq m+1, \quad j = 1, 2, 3, 4,$$

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ACCESSION NR: AP5024200

where x_j, y_j are the coordinates of the vertices of R ; s_{j1} and s_{j2} are the beginning and end of Γ_j . Letting a/h and b/h be integers, $h \leq \min \{a, b\} / (2m + 2)$, he constructs a grid by the lines $x, y = 0, h, 2h, \dots$. With this approximation he significantly improves estimates of the nonregular component of error. This method of refinements also applies when the region has a smooth boundary. He also shows the falsity of an assertion of V. S. Korolyuk on the method of refinements by higher order differences. Orig. art. has: 18 formulas. ⁵⁵

ASSOCIATION: Matematicheskii institut im. V. A. Steklova, Akademii nauk SSSR
(Mathematical Institute, Academy of Sciences, SSSR) ^{44.55}

SUBMITTED: 24Feb65

ENCL: 00

SUB CODE: MA

NO REF SOV: 010

OTHER: 000

Card 2/2 DP

VOLKOV

Solution of the Dirichlet problem using the method of successive
approximation by differences of higher order. Part 1. *Dif. urav.* 1.
no. 7:946-960 31 1965. (vol. 28:8)

1. Matematicheskii Institut imeni V.A. Steklova, Moskva.

L 01224-66 ENT(d) IJP(c)
ACCESSION NR: AP5019618

UR/0376/65/001/007/0946/0960

AUTHOR: Volkov, Ye. A.

22
19
B

TITLE: A solution of the Dirichlet problem by the method of improvement of higher-order differences. I

16,44,55

SOURCE: Differentsial'nyye uravneniya, v. 1, no. 7, 1965, 946-960

TOPIC TAGS: partial differential equation, Dirichlet problem, approximation method, Poisson equation

ABSTRACT: The following network solution is derived for the approximate solution of the Dirichlet problem defined on a rectangle and in a smooth-boundary region:

$$v^q = v + \sum_{k=q}^m h^{\lambda k} w_k + r_q h^{2m+\lambda} (1 + a |\ln h|)^{\epsilon-1},$$

where v^q is the approximate solution after the q th improvement; v is a solution of the Dirichlet problem for Poisson's equation having derivatives of order $(2m+2)$ which satisfy Holder conditions with index λ ; h is a step in the network; w_k^q are traces of certain functions independent of h ; r_q are functions bounded on a^k

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L 01224-66
ACCESSION NR: AP5019618

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constant modulus independent of h ; $\alpha = 1$ in the case of a region with a curvilinear boundary, $\alpha = 0$ for a rectangle; and $q = 1, 2, \dots, m+1$. The desired solution is broken down into two components, the first of which, $F+P+Q$ is expressed in explicit form as a finite combination of elementary functions, and the second, $v = u - (F+P+Q)$, is smooth on a closed rectangle and is found by the method of improvement of higher order differences without recourse to extrapolation beyond the boundaries of the rectangle. Error estimates are made for the difference solution in order to construct the successive improvements. Orig. art. has: 120 formulas.

ASSOCIATION: Matematicheskii institut im. V. A. Steklova (Mathematics Institute)

SUBMITTED: 15Feb65

ENCL: 00

SUB CODE: MA

NO REF SOV: 011

OTHER: 004

Card ^{KC} 2/2

L 4196-66 ENT(d) IJP(c)

ACCESSION NR: AP5024931

UR/0376/65/001/008/1070/1084

AUTHOR: Volkov, Ye. A. 44, 55

TITLE: Solution of the Dirichlet problem by the method of refinements by differences of higher orders. 2

SOURCE: Differentsial'nyye uravneniya, v. 1, no. 8, 1965, 1070-1084

TOPIC TAGS: differential equation, boundary value problem, approximation calculation, difference equation, Laplace equation, Poisson equation

ABSTRACT: Continuing the work of part I, the author studies a method of refinements by higher order differences for a region with a curvilinear boundary for the boundary value problem

$$\Delta u = f(x, y) \text{ on } \Omega, \quad (1)$$

$$u = \varphi(s) \text{ on } \gamma, \quad (2)$$

where γ is the boundary of the region Ω and s is an arc of γ . He obtains a representation of the solution as well as an asymptotic representation. Finally he considers an application of the method of h^2 extrapolation of Richardson and

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L 4196-66

ACCESSION NR: AP5024931

gives certain generalizations and modifications for the method of refinements by higher order differences. He concludes by showing the falsity of an assertion of V. S. Korolyuk on this topic. Orig. art. has: 102 formulas and 1 figure.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova (Mathematical Institute)

SUBMITTED: 15Feb65

ENCL: 00

SUB CODE: MA

NO REF SOV: 015

OTHER: 005

Card 2/2

DP

VOLKOV, Ye.A.

Use of method of refinement by differences of higher order in solving the Dirichlet problem. Dokl. AN SSSR 164 no.3:479-482 S '65. (MIRA 18:9)

1. Matematicheskii institut im. V.A. Steklova AN SSSR. Submitted February 24, 1965.

VOIKOV, Ye.A. (Moskva)

Inconsistency of Batschelet's majorant method and estimation
of the error in solving a mixed boundary value problem by the
method of difference. Zhur. vych. mat. i mat. fiz. 5 no.1:121-124
Ja-F '65. (MIRA 18:4)

VOLKOV, Ye.A. (Moskva)

Use of a Lagrange interpolation polynomial in solving Dirichlet's problem for Poisson's equation by the method of differences. 'har. vych. mat. i mat. fiz. 4 no.3:466-472 My-Je '64. (MIRA 17:)

VOLKOV, Ye.A.

Methods of refinement by high-order differences and h^2
extrapolation. Dokl. AN SSSR 150 no.3:455-456 My '63.
(MIRA 16:6)

1. Matematicheskiy institut im. V.A. Steklova AN SSSR.

Predstavleno akademikom A.A. Dorodnitsynym.

(Boundary value problems)

(Differential equations)

L 10516-63

EWI(a)/FCC(w)/BDS--AFFTC--Pg-4--IJP(O)

ACCESSION NR: AP3000731

S/0020/63/150/003/0455/0458

AUTHOR: Volkov, Ye. A.

57
55

TITLE: Methods for refinement by higher order differences and h_2 extrapolation

SOURCE: AN SSSR. Doklady*, v. 150, no. 3, 1963, 455-458

TOPIC TAGS: approximate solution, Dirichlet problem, mixed boundary value problem

ABSTRACT: The method of successive refinements by high-order differences is applied to constructing the approximate solution of a Dirichlet and mixed-boundary problem for the Poisson equation in a rectangle with nonhomogeneous boundary conditions and with both the right-hand side of the equation and the boundary functions sufficiently smooth. The solution is sought in the form of two components. The first is constructed in an explicit form in terms of a finite number of combinations of elementary functions; the second is a smooth function approximately determined by using the method of refinements by high-order differences. The corresponding difference equations are written using a square

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ACCESSION NR: AP3000731

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net with mesh size h . A solution of the difference equations is derived in which the error of approximation is expressed as an expansion in powers of h . The form of the error of approximation makes it possible to use the method of h^2 extrapolation developed earlier (L. F. Richardson, Phil. Trans. Roy. Soc. Lond., A, 226, 299 (1927)), for the refinement of the approximate solution at various h . The method of refinements is extended to the case of a triangular region with angles $\pi/2$, $\pi/3$, $\pi/4$, and $\pi/6$. Certain other applications and peculiarities of the method of refinements are considered. This article was presented by Academician A. A. Dorodnitsy*n 14 Dec 1962. "The author expresses his deep thanks to S. M. Nikol'skiy for the latter's attention to the present work." Orig. art. has: 9 formulas.

ASSOCIATION: Matematicheskii institut im. V. A. Steklova Akademii nauk SSSR
(Institute of Mathematics, Academy of Sciences SSSR)

SUBMITTED: 10Dec62

DATE ACQ: 21Jun63

ENCL: 00

SUB CODE: MM

NO REF SOV: 006

OTHER: 003

mcs/CA
Card 2/2

VOLKOV, Ye.A. (Moskva)

Removal of singularities in solving boundary value problems
for a Laplace equation in a region with a smooth boundary.

Zhur.vych.mat.i mat.fiz. 3 no.1:109-119 Ja-F '63.

(MIRA 16:2)

(Boundary value problems)

(Differential equations)

VOLKOV, Ye.A. (Moskva)

Method of difference for a boundary value problem with either
an oblique or a normal derivative. Zhur.vych.mat.i mat.fiz. 1
no.4:607-621 J1-Ag '61. (MIRA 14:8)
(Boundary value problems) (Harmonic functions)

32895

16,6500 16.4100

S/044/61/000/012/051/054
C111/C222

AUTHOR: Volkov, Ye. A.

TITLE: On a method for calculating uniform approximations of functions

PERIODICAL: Referativnyy zhurnal, Matematika, no. 12, 1961, 53, abstract 12V315. ("Zh. vychisl. matem. i matem. fiz.", 1961, 1, no. 2, 343-345)

TEXT: A simple method is given to calculate uniform approximations of functions given by power series. For the function

$$f(x) = a_0 + a_1x + a_2x^2 + \dots$$

an approximation on the interval $[-\alpha, \alpha]$ is constructed as a polynomial $P_m(x)$ of the smallest possible degree m ; the error is:

$$|f(x) - P_m(x)| < \epsilon$$

The construction is obtained by convolution of the highest term, using a Chebyshev polynomial. A numerical example is given.

[Abstracter's note: Complete translation.]

Card 1/1

ACCESSION NR: AP4030772

S/0020/64/155/004/0735/0738

AUTHOR: Volkov, Ye. A.

TITLE: Effective estimation of error in the solution of the Dirichlet problem (for the Laplace equation) for polygons by the method of nets

SOURCE: AN SSSR. Doklady*, v. 155, no. 4, 1964, 735-738

TOPIC TAGS: partial differential equation, Dirichlet problem, harmonic function, boundary value problem, approximate method, difference equation, finite difference method, numerical analysis

ABSTRACT: It is known that in the approximate solution of the Dirichlet problem (for the Laplace equation) by the method of nets, if h is the mesh of the net, the error is of the order of h^K , where $1 \leq K \leq 6$, under the assumption that the given boundary value function has bounded derivatives of order K . This does not apply to the case of a polygonal region M , because even for very smooth boundary values, the derivatives may be unbounded in M . Continuing the work of earlier papers and using the results of O. D. Kellog, the author gives some estimates for the derivatives of a function harmonic on

Card 1/3

ACCESSION NR: AP4030772

a polygon. Let $u(x,y)$ be harmonic in polygon M with sides $\Gamma_j (j=1,2,\dots,n)$ and satisfy boundary conditions $u = \varphi_j(s)$ on Γ_j . Let $\Phi = \max_j \sup_{\Gamma_j} |\varphi_j|$,

$U'(E) = \max_{\substack{-\pi \leq \theta \leq \pi \\ \delta \leq \delta_0}} \sup_{\substack{x_0, y_0 \\ \delta \leq \delta_0}} \left| \frac{\partial^{n-2} u}{\partial x_0^{n-2} \partial y_0^2} \right|$, where (x_0, y_0) is the coordinate system

obtained from (x,y) by a rotation through angle θ . For $\delta > 0$, let M_δ be the region consisting of those points of M which are at a distance $> \delta$ from its boundary. Then the simplest result stated is:

$$U'(M_\delta) \leq \mu |4 \Phi / \pi \delta^n|, \mu \geq 0 \quad (2)$$

Next are given the coefficients of an asymptotic expansion of the harmonic function u near the vertices of the polygon, in terms of the maximum moduli of the derivatives on the boundary. This is used in setting up a modified system of finite difference equations for the approximate solution of the Dirichlet problem, and estimating the error. Analytic estimates of the Gershgorin type, but expressed in terms of known quantities, are derived, and a method for obtaining more precise estimates is outlined, based on the solution of an auxiliary system of difference equations (adaptable to automatic computing). For sufficiently smooth boundary values, this method

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ACCESSION NR: AP4030772

yields approximate solutions approaching the exact solution at the rate of $h^{m-2-\epsilon}$, where $4\epsilon=4\delta$. The results can be extended to multiply connected regions bounded by polygonal lines, and for other types of nets. "The author expresses his sincere gratitude to S. M. Nikol'skiy for his interest in the present work." Orig. art. has: 9 equations.

ASSOCIATION: Matematicheskii institut im. V. A. Steklova Akademii nauk SSSR (Mathematics Institute, Academy of Sciences, SSSR)

SUBMITTED: 09Dec63

ENCL: 00

SUB CODE: MA

NR REF SOV: 007

OTHER: 004

3/3

Card

ACCESSION NR: AP4037251

S/0208/64/004/003/0466/0472

AUTHOR: Volkov, Ye. A. (Moscow)

TITLE: The application of the Lagrange interpolation polynomial for the solution by the method of nets of the Dirichlet problem for the Poisson equation

SOURCE: Zhurnal vysshislitel'noy matematiki i matematicheskoy fiziki, v. 4, no. 3, 1964, 466-472

TOPIC TAGS: Lagrange interpolation polynomial, Dirichlet problem, Poisson equation, nets method, error estimate, canonical system, canonical system solution

ABSTRACT: A study has been made of the solution of the Dirichlet problem for the Poisson equation by the method of nets. For the construction of difference equations in lattice points of the net close to the boundary of domain Ω , a Lagrange interpolation polynomial is applied whose coefficients A_{ka} have alternating signs and

Card 1/3

ACCESSION NR: AP4037251

in general do not satisfy the condition

$$\sum_{\alpha=1}^N |a_{k\alpha}| \leq 1 \quad (k=1, 2, \dots, N).$$

With the aid of the Lagrange interpolation polynomial of the third degree for the approximate solution of the Dirichlet problem, a system of difference equations for a triangular net of mesh size h is presented. The concept of the canonical systems of difference equations is defined. The system of difference equations derived for the solution of the Dirichlet problem is assumed to be canonical, for which a unique solution is shown to exist. Auxiliary canonical systems of difference equations are taken and two lemmas establishing the upper bounds of their solutions are presented. It is shown that the error E_h of the approximate solution of the Dirichlet problem satisfies a system of canonical difference equations. On the basis of the lemmas presented, the error estimate for the approximate solution of the Dirichlet problem is obtained. The error

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ACCESSION NR: AP4037251

estimate for the case where domain Ω is convex is also given. The method for an approximate solution of the canonical system is presented. Orig. art. has: 4 formulas.

ASSOCIATION: None

SUBMITTED: 16Apr63

DATE ACQ: 09Jun64

ENCL: 00

SUB CODE: MA:

NO REF SOV: 004

OTHER: 002

Card 3/3

VOLKOV, Ye.A.

Solving the Dirichlet's inside problem for Laplace's equation by
means of lattices. Vych. mat. no.1:34-61 '57. (MLBA 10:11)
(Operators (Mathematics)) (Difference equations)
(Errors, Theory of)

NOLROY
VOIKOV, Ye.A.

Investigating the possibility to increase the accuracy of the method
of lattices for the solution of Poisson's equation. Vych. mat. no.1:
62-80 '57. (MLRA 10:11)
(Difference equations) (Numerical calculations)

VOLKOV, Ye A.

PHASE I BOOK EXPLOITATION 711

Akademiya nauk SSSR. Institut tochnoy mekhaniki i vychislitel'noy tekhniki
Vychislitel'naya tekhnika (Computer Engineering) Moscow, Izd-vo AN SSSR,
1958. 150 p. 4,500 copies printed.

Responsible Ed.: Lebedev, S. A., Academician; Ed. of Publishing House:
Grigor'yev, Ye. N.; Tech. Ed.: Prusakova, T. A.

PURPOSE: This book is intended for specialists engaged in the design and use
of electronic computers.

COVERAGE: A number of problems of computer engineering is discussed in this
collection of articles. The power supply system of high-speed electronic
computers of the USSR Academy of Sciences, new computer components and
devices, and methods of controlling arithmetic units are covered in this
publication. Methods of selecting the necessary word from the mechanical
dictionary in machine translation and the terminology of modern computing
machines are also presented. For references see Table of Contents.

TABLE OF CONTENTS:

From the Editor

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Card 1/5

711

Computer Engineering

Encherbakov, O. K. Power Supply System of the High-Speed Electronic Computer of the USSR Academy of Sciences

5

This article represents a summary of a three-year period (1952-1955) of observing the operation of power-supply equipment for the high-speed electronic computer of the USSR Academy of Sciences. The results of a number of experiments conducted during that period are given and the improvements which may be applied in future projects are discussed. No personalities are mentioned.

Mayorov, F. V. Digital Differential Analyzers

21

A description of the construction and operation of various components of digital differential analyzers is given. Methods of solving different problems on the analyzer are also presented. It is stated that the described analyzer was developed in the USA in 1950. There are 22 references, of which 1 is Soviet and 21 English.

Golovistikov, P. P. Dynamic Triggers and Their Use in Parallel-action Computers

82

Various types of dynamic triggers such as those used in shift circuits, memory capacitor triggers, and delayed-line triggers of computers are discussed in this article. Pulse code inversion and addition, pulse-shift operation, and pulse decoder operation are also presented. The article

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Computer Engineering

711

contains a number of trigger diagrams and characteristics. There are 9 references, of which 5 are Soviet (including 1 translation) and 4 English. No personalities are mentioned.

Volkov, Ye. A. A Method of Automatic Control of a Sequential Arithmetic Unit

112

A brief discussion of the operation of a binary-code sum circuit is given and the methods of addition and multiplication are presented. There are 2 references of which 1 is English and 1 Czech. No personalities are mentioned.

Korolev, L. N. Methods of Selecting the Necessary Word From the Dictionary

116

This article discusses the problem of word selection from the mechanical dictionary. Four different search methods for obtaining necessary information are presented. There is 1 English reference.

Matyukhin, N. Ya., Rosnitskiy, O.V. Ferrite-Core Operation in Matrix Memory Devices

119

The problem of selecting the proper operating conditions for the most useful performance of a ferrite-core is presented, and an analysis of core operation is made in this article. The interferences existing in matrix devices are covered and methods of eliminating them are briefly discussed. It is stated that the methods of determining ferrite-core quality discussed in this article were studied experimentally in the Lab-

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67072

SOV/44-59-9-9540
1959, Nr 9, p 180 (USSR)

28(2) 16,9500

Translation from: Referativnyy zhurnal. Matematika, 1958, 112-116
AUTHOR: Volkov, Ye. A.

TITLE: A Method for the Automatic Control of a Computing Device of
Successive Method of Operation

PERIODICAL: Vychisl. tekhn. M., AN SSSR, 1958, 112-116

ABSTRACT: It is proposed to control the work of a successive adder by starting from the simple rule that the number of unities in the codes of the summands and of the sum plus transfers is equal, or from the rule of the parity of summation. For the realization of these rules the author introduces a so-called control trigger; it counts the unities in the summands during the arrival from the storage, the unities of the sum during the writing down of them. If the adder works correct, then the control trigger comes back in the initial state, e.g. "0". For the operation of multiplication the number of the unities in the code of the product plus the number of all transfers (for the adding of the multiplicand to the partial products) is odd only if the number

Card 1/2

28(2)

A Method for the Automatic Control of a Computing Device of Successive Method of Operation

67072
SOV/44-59-9-9540

of the unities is odd in the code of the multiplicand as well as in the code of the multiplier. Here the control trigger is set to "1" if the number of unities in the codes of both factors is odd. During the multiplication the control trigger must come to "0". Analogous and during the writing down of the product it must come to "0". Analogous and during the rules hold for a shift operation, an inversion of the code and a rounding off. For the division the control specifications are not formulated because of more complicated procedures. It is remarked that, if necessary, the division can be controlled by a programming of the inverted multiplication. For a refinement of the control it is desirable to form the transfer impulse of the initial signals and not to take it at the outlet of the adder. In this case an intermediate trigger is necessary which supplies the signal to the control trigger.

A.F.Smirnov

4

Card 2/2 .

VOLKOV, Ye.A.

Differential properties of solutions to boundary value problems
for Laplace and Poisson equations on a rectangle. Trudy Mat. inst.
77:89-112 '65.

Differential properties of solutions to boundary value problems
for Laplace equations on polygons. Ibid.:113-142.
(MIRA 19:1)

VOLKOV, Ye. A.

Effective estimates of the error involved in solutions by the method of difference of the Dirichlet problem for the Laplace equation on polygons. Dokl. AN SSSR 155 no. 4:735-738 Ap '64.
(MIRA 17:5)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR. Predstavleno akademikom A.A.Dorodnitsynym.

VOLKOV, Ye.A.

Solution of boundary value problems for Poisson's equation
in a rectangle. Dokl. AN SSSR 147 no.1:13-16 N '62.
(MIRA 15:11)

1. Matematicheskii institut im. V.A. Steklova AN SSSR.
Predstavleno akademikom A.A. Dorodnitsynym.
(Boundary value problems)
(Difference equations)

VOLKOV, Yevgeniy Borisovich, dots., kand. tekhn. nauk, inzh.-polkovnik;
KISELEV, S.P., red.; KATANUGIN, M.Ye., red.; KRASAVINA, A.M.,
tekhn. red.

[Rocket engines] Raketnye dvigateli. Moskva, Voen. izd-vo M-va
oborony SSSR, 1961. 58 p. (MIRA 14:12)
(Rockets (Aeronautics))

ACC NR: AP7000285

(A)

SCURCE CODE: UR/OL43/66/000/011/0090/0093

AUTHORS: Smol'nikov, L. P. (Candidate of technical sciences, Docent); Sofronov, V. G. (Engineer); Volkov, Ye. F. (Engineer); Bychkov, Yu. A. (Engineer)

ORG: Leningrad Electrical Engineering Institute im. V. I. Ul'yanov (Lenin)
(Leningradskiy elektrotekhnicheskii institut)

TITLE: An optimal digital servo system

SOURCE: IVUZ. Energetika, no. 11, 1966, 90-93

TOPIC TAGS: servosystem, optimal automatic control, rolling mill, digital system, electric motor, trigger circuit, magnetic amplifier, electronic feedback, second order differential equation / DP-42 electric motor

ABSTRACT: A brief description of a digital servo system for automatic control of the clamping device on a sheet rolling mill is presented. The servo system (see Fig. 1) uses an electromagnetic shaft position-to-digital converter (SDC) as the pickup of the true position of the upper roller B. An arithmetic device (AD) continuously calculates the difference $\epsilon = A - B$ between the assigned position of the upper rollers A and B. The positive or negative difference (obtained in binary code) is converted to a voltage proportional to this difference by code-to-voltage converters (CVC). Near-to-optimum response speed of the system can be achieved by using strong linear motor-speed feedback. An experimental study performed directly on a mill

Card 1/2

UDC: 62-503.53

ACC NR: AP7000285

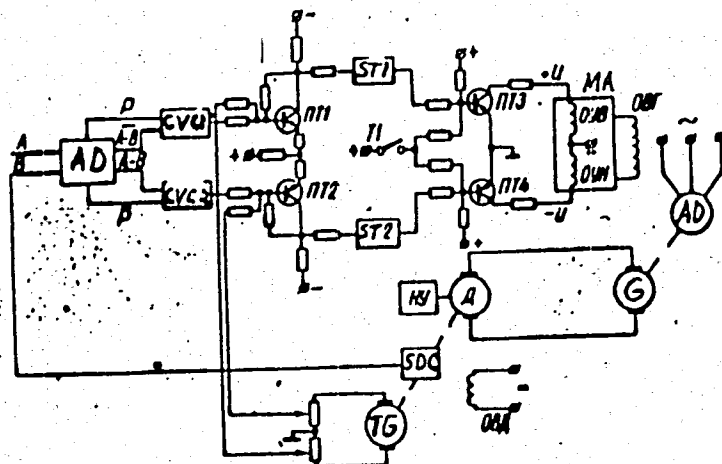


Fig. 1. Circuit of digital servo system: ST - Schmitt trigger circuit; MA - magnetic amplifier; M - motor; G - generators; TG - tachogenerator

showed that the realization of near-to-optimum control ensured the required accuracy of stopping the electric drive without using "creeping" speeds in various movements of the upper roller. The dynamics of the electric-drive system is approximately described by a second-order linear differential equation. The time constant is 1.2 sec. Orig. art. has: 1 diagram and 1 graph.

SUB CODE: 09,13/SUBM DATE: 26Apr65/ ORIG REF: 003

.Card 2/2

SMOL'NIKOV, L.P. (Leningrad); BYCHKOV, Yu.A., (Leningrad); VOLKOV, Ye.F.
(Leningrad)

Study of a third-order automatic control system optimum in
respect to the sense of braking time with stabilized speed.
Izv. AN SSSR. Tekh. kib. no.5:157-163 S-O '63. (MIRA 16:12)

VOLKOV, V. G., Ing. tekhn. nauk, dokt. nauk

Operating modes of the output units of transit klystrons and choice
of optimum coupling of resonators and loads. Izv. LETI no.52:3-12
164. (MIRA 18:9)

VOIKOV, Ya.G., kand. tekhn. nauk, dokent; SUCHALKIN, D.D., inzh.

Amplifying decimeter band klystron with 1 kw. output power.
Izv. IETI no.52:13-25 '64. (MIRA 18:9)

VOLKOV, Ye.G., kand.tekhn.nauk

Grouping characteristics of electrons in a three-cavity klystron.
Izv. LETI no.38:187-198 '59. (MIRA 13:8)
(Klystrons)

L 63428-65 EEC(h)-2/EM(h)/EET(1) JM

ACCESSION NR: UR5004568

S/0275/64/000/011/A019/A019
621.385.623.4

SOURCE: Ref. zh. Elektronika i yeye primeneniye. Svodnyy tom, Abs. 11A106

AUTHOR: Volkov, Ye. G.

TITLE: Klystron output conditions and optimal resonator-load coupling

CITED SOURCE: Izv. Leningr. elektrotekhn. in-ta, vyp. 52, 1964, 3-12

TOPIC TAGS: klystron, klystron efficiency, klystron maximum efficiency

TRANSLATION: The effect of the klystron output-resonator-load coupling on its efficiency is considered. The output resonator is represented by an equivalent circuit, and its oscillatory power is represented as a sum:

$$P = \frac{U^2}{2R_n} + \frac{U^2}{2R_n}$$

where the first term means the power loss including that in the resonator electron load and the second term represents the net power evolved in the load. A maximum-efficiency condition is determined by this parameter: $M^2 \cdot \gamma R_{oc} / R_n$.

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L 63188-65

ACCESSION NR: AR5004563

Here, M is the electron-interaction factor, γ is the amplitude factor of the first harmonic, $\frac{1}{R_{oe}} = \frac{1}{R_n} + \frac{1}{R_n}$, R_0 is the beam resistance. With $M^2 \gamma R_{oe} / R_0 < 1$.

the maximum efficiency results when $R_n = R_{n1}$. In the case of $M^2 \gamma R_{oe} / R_0 > 1$

some electrons stop in the interaction space and turn back. Under these conditions, the maximum efficiency would require that R_n exceed R_{n1} . The theoretical maximum efficiency is 0.5 γ (58%). Experimental curves of maximum output power vs. current are presented for various load-coupling values; they corroborate the theoretical conclusions.

SUB CODE: EC

ENCL: 00

Card 2/2

L 64471-65 ENT(1)/EWA(h)

ACCESSION NR: AH5005450

S6275/64/000/012/A021/AQ21
621.385.623.4

16
B

SOURCE: Ref. zh. Elektronika i yeye primeneniye. Svochnyy tom, Abs. 12A111

AUTHOR: Volkov, Ye. G.; Suchalkin, D. D.

TITLE: One-kw klystron amplifier for a 10-cm band

25

CITED SOURCE: Izv. Leningr. elektrotekhn. in-ta, vyp. 52, 1964, 13-25

TOPIC TAGS: klystron, klystron amplifier, 1 kw klystron, 10 cm klystron

TRANSLATION: The design is described, and the results of testing are discussed of a 1-kw 10-cm cw klystron amplifier prototype. The 3-resonator klystron has gridless gaps. It has a coaxial input and a rod-radiator output equipped with a junction to a 10-cm waveguide. The electron beam is shaped by a Pierce optics. The compression factor is 10. An electronically heated tantalum cathode ensures a uniform emission from the cathode surface and a sufficient life. The cathode assembly is shielded by placing it inside the cavity of a magnetic polepiece which is an integral part of the klystron. The magnetic polepiece is not a part of the klystron vacuum envelope; it is used for cooling. An axial magnetic field

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L 64471-63

ACCESSION NR: AR5005450

ensures a constant electron beam. Toroidal resonators are employed. A capacitive frequency tuning is attained through a deformation of the resonator side wall which is represented by a flexible diaphragm. The maximum output obtained from the tested prototypes was 1070 w with a gain of about 300. A gain of 1000 could be obtained with an output of 800 w. The noncoincidence of the output and gain maxima is due to some peculiarities of the cascade bunching, to various modes of operation of the second resonator, and to the input level. The klystron was supplied by a controllable 12-kv rectifier. Experimental data obtained from the output power vs. supply voltage tests can serve for rough determination of the required supply stability. The klystron efficiency was over 20% under some conditions. Results also have been obtained which permit evaluating the effect of various factors on the klystron performance and finding ways to increase the klystron output. Bibliography: 3 titles.

SUB CODE: EC

ENCL: 00

Card 2/2 *llc*

L 63486-65 EEX(h)-2/EWA(h)/EWT(1) JM
ACCESSION NR: AR5004569

S/0275/64/000/011/A019/A019
621.385.623.4

18
33

SOURCE: Ref. zh. Elektronika i yeye primeneniye. Svodnyy ton, Abs. 11A107

AUTHOR: Volkov, Ye. G.; Suchalkin, D. D.

TITLE: Peculiarities in the operation of a klystron amplifying short pulses

CITED SOURCE: Inv. Leningr. elektrotekhn. n-ta, vyp. 53, 1964, 216-227

TOPIC TAGS: klystron, pulsed klystron

TRANSLATION: The effects of various factors is considered which distort the amplified pulse shape in a klystron and restrict the minimum duration of pulses. Two methods of modulation with the klystron operating under pulse conditions are compared: the pulse-excitation method and the pulse-controlled beam current method. The method of current modulation by means of an additional control electrode in the gun is preferable from the viewpoints of economy and pulse shape; the pulse shape at the input is almost completely determined by the control-pulse and gun characteristics. The transients mostly affect the flat top of the pulse. Intermediate stages have an essential influence on the further pulse-shape changes. With ro

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L 63486-65

ACCESSION NR: AR5004569

external load, the intermediate resonators have a narrowest frequency band. Pulse transmission can be improved by detuning the intermediate resonators with respect to the working-signal frequency. The best results can be obtained by detuning the intermediate resonators toward higher frequencies. The processes in the output resonator have but little effect on the pulse shape. This is due to the fact that the resonator coupled to the external load has a wide frequency band. The output-stage effects on the pulse shape are different for "small" and "large" amplitudes. Under small-signal conditions, the output-pulse shape is largely determined by the transients in the preceding stages. Under large-signal conditions, the output stage undergoes a sort of "saturation" which smoothes out the pulse top. The output-stage "restriction" phenomenon may be due either to an optimal bunching in the last drift space or to "ejection" of electrons in the output resonator. The theoretical results were verified experimentally on a 4-resonator medium-power klystron. The above data may prove useful for designing and operating of pulsed klystrons. Bibliography: 4 titles.

SUB CODE: EC

ENCL: CO

Card 2/2

S/058/60/000/004/013/016
A003/A001

Translation from: Referativnyy zhurnal. Fizika, 1960, No. 4, p. 256, # 9392

AUTHOR: Volkov, Ye.G.

TITLE: Peculiarities of the Grouping of Electrons in a Three-Resonator
Klystron ²²

PERIODICAL: Izv. Leningr. elektrotekhn. in-ta, 1959, No. 38, pp. 187-198

TEXT: The cascade grouping of electrons in a three-resonator klystron is investigated theoretically in a kinematic approximation. For two particular cases, i.e., for conditions characterized by a high value of the variable velocity of electrons by the instant of modulation of the beam by the second resonator, and for conditions characterized by the considerable density modulation of the beam by the same instant, the first harmonic of the current in the third resonator is determined. The analysis of the expressions obtained showed that in the presence of an excessive (in comparison with the conditions corresponding to the maximum amplification) excitation power, the three-resonator

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Card 1/2

S/058/60/000/004/013/016
A003/A001

Peculiarities of the Grouping of Electrons in a Three-Resonator Klystron

klystron can function with a higher electronic efficiency factor.

M.B. Golant

✓B

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

24,3600

3421
SOV/112-59-23-48286

Translation from: Referativnyy zhurnal Elektrotehnika, 1959, Nr 23, p 147
(USSR)

AUTHORS: Volkov, Ye.G., Krylov, K.N.

TITLE: Electron Beam Formation by a Magnetic Field Distorted in the
Cathode Region by Ferromagnetic Bodies

PERIODICAL: Izv. Leningr. elektrotekhn. in-ta, 1958, Nr 35, pp 185 - 194

ABSTRACT: An experimental electronic optical system is described in which the focusing and maintenance of the form of a beam over the necessary length is realized by means of a magnetic field only. A uniform magnetic field, necessary to maintain the form of a beam, is generated by a solenoid into which an electronic tube is inserted. Magnetic field of a special configuration, necessary to focus the beam (in the cathode region) is obtained through deformation of solenoidal field by ferromagnetic bodies. A special electronic tube was developed to study the resulting form of a beam.

Card 1/1

N.A.O. ✓

28320

8/112/60/000/010/003/004
A052/A101

9.4220

AUTHOR: Volkov, Ye.G.

TITLE: Characteristics of electron bunching in the three-cavity klystron

PERIODICAL: Referativnyy zhurnal. Elektrotehnika, 1960, no. 10, 244, abstract 5.5304. (Izv. Leningr. elektrotekhn. in-ta, 1959, no. 38, 187 - 198) X

TEXT: A theoretical analysis of some laws of the cascade electron bunching in the three-cavity floating-drift amplifying klystron. Expressions for the transit angle and electron current, exciting the output resonator, are derived. These expressions make it possible to calculate the variable component of the klystron current on sufficiently general assumptions. It is shown, that under conditions of an additional bunching of the electron flux in the second resonator, in the presence of excessive exciting power, a higher electronic efficiency can be obtained.

[Abstracter's note: Complete translation]

V.V.L.

Card 1/1

CA

VOL'KOV, Ye. I.

Recovery of used petroleum. E. I. Volkov. *Suk-
harnaya Prom.* 20, No. 4, 21-0 (1947); *Chem. Zvesti,*
1948, 1, 255. In the app. described, used lubricating oils
are first heated in a tank equipped with steam coils. This
ppts. the heavier impurities. The oil is then filtered, by
using compressed air pressure. M. G. Moore

VOLKOV, Ye.I., inzh.

Precast reinforced concrete sidewalks and drain chutes in workings.
Shakht. stroi. 4 no.3:24-25 Mr '60. (MIRA 13:11)

1. Kuznetskiy nauchno-issledovatel'skiy institut Shakhtostroy.
(Precast concrete) (Mine drainage)